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TASK ANALYSIS OF STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES AND DEVELOPMENT OF STAFFING GUIDELINES

VOLUME C. DETAILED TASK DATA, AND STAFFING GUIDANCE. FIELD ENFORCEMENT

APPLIED SCIENCE ASSOCIATES, INC.

PREPARED FOR
ENVIRONMENTAL PROTECTION AGENCY

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Task Analysis of State and
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Development of Staffing Guidelines

VOLUME C
Detailed Task Data, and Staffing Guidance
FIELD ENFORCEMENT

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Task data and staffing guidance are presented covering a group of related tasks which are typically performed within or in support of the field enforcement efforts of an agency. The operations are performed by members of the occupational category of Field Enforcement Officer. The following tasks are included: (1) routine inspection; (2) complaint investigation; (3) patrol of assigned areas or routes and citation of violators of air pollution control regulations; (4) assist the legal staff in preparation of enforcement actions; (5) serving as a witness in court or at a hearing; and (6) organization and operation of a smokeschool.

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Task Analysis of State and Local Air Pollution Control Agencies and Development of Staffing Guidelines

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VOLUME C

Detailed Task Data, and Staffing Guidance FIELD ENFORCEMENT

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This is not an official policy and standards document. The opinions, findings, and conclusions are those of the authors and not necessarily those of the United States Environmental Protection Agency. Every attempt has been made to represent the present state of the art as well as subject areas still under evaluation. Any mention of products, or organizations, does not constitute endorsement by the United States Environmental Protection Agency.

INTRODUCTION

One of the pressing problems in the air pollution control effort at Federal, state, and local levels is planning manpower requirements and developing manpower resources. Questions are being asked such as, how many people are needed, what kind of past experience and education should they have, how should their jobs be structured, what do they need to know to do their jobs, what special abilities do they need, and what kind of training should they receive to do their jobs? These questions are becoming increasingly meaningful as the control effort broadens with the creation of more and more local agencies and as existing agencies increase the scope and depth of their programs. Adequate answers are required if progress is to continue toward the goal of clean air.

In order to begin to answer questions relevant to manpower planning and development, a data base describing the tasks to be performed by control agency personnel and the skills and knowledge they must have to perform those tasks effectively must be available. Guidance concerning the use of the data base in making staffing decisions must be prepared. It is the purpose of this study to provide such a data base and the appropriate guidance.

A. Objectives

The objectives of this project were the following:

1. To identify as great a proportion as possible of the population of tasks currently being performed by air pollution control agency personnel at the state and local level throughout the country.
2. To describe the identified tasks in terms of component behaviors and the skills and knowledge required to perform those behaviors.
3. To identify and describe categories of air pollution control agency personnel who would perform the tasks mentioned above.

continued

4. To structure and communicate the data which resulted from achieving the above objectives in a form which could be used by agency management in planning and developing manpower resources.

B. General Project Overview

The project was performed in two phases. Phase I dealt with achieving the first two project objectives, and resulted in the development of a detailed data base iescribing the major tasks performed by agency personnel in terms of the procedural components of the tasks and the skills and knowledge required to perform them. Phase II dealt with achieving the last two major objectives, and resulted in production of a guidance document which integrates and structures data developed in Phase I and presents it in a form designed to assist agency manpower developers.

THIS IS VOLUME C
Additional books available are:

VOLUME A: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Introduction and Directions for Using These Guidelines

VOLUME B: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Engineering

VOLUME D: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Laboratory Support

VOLUME E: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Air Monitoring and Meteorological Support

VOLUME F: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Source Testing

VOLUME G: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Agency Management, Program Development, and Public Information Support

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FIELD ENFORCEMENT

The task data and staffing guidance presented ~~in this volume~~ cover a group of related tasks which are typically performed within or in support of the field enforcement efforts of an agency. The operations are performed by members of the occupational category of Field Enforcement Officer. The following tasks are included and are located within the volume as indicated below:

1. Routine Inspection — Page C-3
2. Complaint Investigation — Page C-21
3. Patrol of Assigned Areas or Routes and Citation of Violators of Air Pollution Control Regulations — Page C-32
4. Assist the Legal Staff in Preparation of Enforcement Actions — Page C-38
5. Serving as a Witness in Court or at a Hearing — Page C-45
6. Organization and Operation of a Smokeschool — Page C-48

Routine Inspection

Task Overview

Most agencies have a group of people who perform relatively standardized and routine inspections. Typically, these inspections cover relatively small incinerators and boilers in schools, small businesses and industries, and apartment houses. These inspections frequently are proceduralized to the extent that the inspector uses a standard form or checklist of equipment elements and operating procedures to inspect with specific acceptable or unacceptable conditions called out.

Standardized inspections are usually performed to support agency activities including:

1. Annual or semi-annual inspection efforts.
2. Complaint investigations.
3. Equipment registration.
4. Investigations of alleged smoke or open burning violations.
5. Enforcement of episode control source curtailment requirements.
6. Fuel and solvent sampling.

Most inspections, regardless of who does them and what equipment they cover, have in common some general task requirements. These requirements include:

1. Visual inspection of equipment and operations which can result in air pollution.
2. Interaction with personnel who operate or manage the equipment.
3. Attention to details of equipment design or operation which may be in violation of local regulations.
4. Collection and reporting of specific information about the equipment and processes.
5. Concern for public relations and ethical considerations.

Occupational Category: Field Enforcement Officer

Task Description

The following task description package is intended to be applicable to the broad spectrum of possible routine inspection tasks. Detailed examples have been incorporated to illustrate the variety of specific skills and knowledge required.

1. Identify the objective of the inspection and perform all required preinspection activities. These preinspection activities could include:

   a. Secure and read the background data describing the unit to be inspected. The descriptive material may be general or specific to the exact plant, equipment to be inspected, or anticipated pollution problem.

      In the case of more complex units, prepare or secure and then review basic flow diagrams, plot plans, process descriptions, or drawings before the actual inspection.

      Another area of background data to review would be relevant files describing other agency activities regarding the unit to be inspected. For example, files containing permit data, prior violations, and compliance program details may contain useful information.

   b. If more than one inspector is required, identify the type and number of required assistants and make arrangements for securing them. Define the roles of the assistants and rehearse or brief them accordingly.

   c. Identify the materials (e.g., data collection forms) and equipment required for the inspection, and secure them in the appropriate numbers.

   d. Identify the need for assistance from plant personnel. Determine the types of people (in terms of knowledge, experience, responsibility) and the numbers required.

2. On approaching the inspection site, carefully review the scene. Generally, locate and note items of interest including:

   a. Smoke stacks

   b. Exhaust vents

   c. Incinerators

   d. Pollution control equipment

   e. Materials loading and storage areas

   f. Effluent water containers

   g. Evidence of open burning

   Also, maintain awareness for localized air pollution conditions including:

   a. Smoke

   b. Odors

   c. Settled dust

   d. Stains due to emission of air contaminants

   e. Damage to vegetation

3. Contact the highest ranking authority present at the plant. Inform him of the planned inspection and request permission to enter. Also, describe and request the desired assistance from plant personnel. It may be necessary to cite the relevant local regulations which define the inspector's duties and give him the right to perform them. If permission to enter is not granted follow the appropriate procedure for refused entry.

4. Locate the equipment to be inspected and make the required observations. Typically, a data collection form is used to cue the inspector to specific characteristics of the equipment. Also, collect all required data related to operation of the equipment. It may be necessary to secure information from equipment operators, management, or company records.

5. In the case of an open burning situation observe the scene and collect and record the required information, which might include:

   a. Size of the fire (diameter and height).

   b. Location with regard to surrounding buildings and activities.

   c. Materials being burned.

   d. Determine whether the fire is prohibited by local regulations. For example, does the burner have a legitimate permit? Is the fire exempt from open burning regulations?

   e. Identify the person(s) responsible for the fire, attending the fire.

   f. Take photographs of the scene.

6. Identify the violations of local regulations and prepare and serve notices of violation. The notice of violation is usually a complete statement of the violation condition and is frequently the basis for court action taken. Therefore, it must be complete and factual. Notices of violation are used to document most if not all of the types of violations possible (e.g., smoke, fumes, public nuisance). The notice usually requires information describing the violation, including:

   a. Information identifying and describing the violator (e.g., name, address, phone number, person to contact).

   b. Designation of the code section violated and a description of the violation.

   c. Conditions of observation (wind direction, sun location, visibility, observer's position relevant to the source, times of observation, smoke characteristics).

   d. Remarks made by operator or manager.

   e. Identification and location of source (e.g., stack designation, location, height).

   f. General facts (e.g., responsibility for violation, equipment condition, character of operating procedures).

   g. Recommended action.

The exact procedure followed for completing violation notices is a function of the agency and adherence to it is strictly enforced. Also, every locality has its own regulations and exemptions, and the inspector must interpret this information to determine if a violation has been committed.

7. Prepare a general field report. A general type of form is usually used to describe results of an inspection in addition to formal notices or other special forms. The form can be used to describe suspected or near violations, follow-up inspection findings, and any other objectives not directly related to violations. These forms are usually filled in with narrative statements describing the purpose and findings of the inspection and any relevant statements made by the operator or manager of the process being inspected.

Skill Requirements

1. Ability to reliably and accurately judge visible emissions from stationary sources in terms of density and opacity using accepted procedures. The precision of these judgments should be adequate to serve as acceptable evidence in a court of law.
2. Ability to accurately observe, describe, or estimate environmental conditions current at the time of a smoke observation, including wind speed and direction, relative humidity, temperature, and percent cloud cover.
3. Ability to reliably and accurately detect or characterize odors such that illegal concentrations can be identified and related to the responsible source. The terminology and procedure used to rate or describe odors vary from agency to agency and depend upon accepted legal requirements.
4. Ability to secure cooperation and assistance from the operator or manager of the source or plant being inspected.
5. Ability to locate, recognize, or describe specific equipment characteristics which must be identified during routine incinerator and boiler inspections (e.g., damper type, burner type, smoke sensors on an incinerator; grate type, method of firing, burner

type, and type of burner controls on a boiler). Also, ability to recognize and describe types of materials burned in both types of devices.

6. Ability to prepare inspection or engineering field reports which are adequately detailed, complete, and cogent to be accepted as evidence in a court of law.

7. Ability to identify, recognize, or locate external characteristics of plants or installations where indications of pollution are most likely to be revealed (e.g., stacks, vents, loading areas).

8. Ability to interact with company management or use company records to secure operating information related to emissions (e.g., type of fuel used, amount consumed per unit time, type and amount of process materials).

9. Ability to recognize, describe, or judge the source of plant damage or general categories of stains or deposits formed by settlement of air contaminants. Such categories of stains or deposits include:

    a. Acid stains (e.g., chromic acid, sulfuric acid, hydrofluoric acid, and phosphoric acid)

    b. Oil droplets

    c. Paint deposits

    d. Carbon spheres

10. Ability to take acceptable photographs of the physical evidence of air contamination or open burning violations. Photographs should be adequately focused, framed, and exposed.

11. Ability to completely and accurately fill out a notice of violation within a reasonable period of time. All narrative sections of the notice should be concise, factual, and legible.

12. Ability to answer the violator's questions regarding how he should react to the notice (e.g., pay fine by mail, appear in court). This reaction may depend on the nature of the violation.

13. Ability to recognize (i.e., perceive) violations and symptoms of violations of the local regulations. The types of violations to be perceived include:

    a. Smoke density or opacity

    b. Public nuisance (odors, stains due to air contaminants)

    c. Open burning

    d. Failure to adhere to emergency emission curtailment plans

    e. Permit system violations (e.g., operation without appropriate permit)

    f. Settled dust

    g. Inadequate incinerator or boiler design or operating features

14. Ability to identify or verify the specific section of local regulations which was allegedly violated as reported by enforcement personnel.

15. Ability to select an enforcement action which is appropriate for the specific type of violation or circumstances observed (e.g., ticket, warning).

16. Ability to use agency files, source process data, and other methods to develop the appropriate background data to initiate an inspection of a stationary source.

17. Ability to interpret engineering drawings (e.g., plot plans, process flow diagrams) in order to plan for an inspection or locate and identify equipment in a facility.

18. Ability to recognize operating characteristics or design features of small incinerators and boilers which are suboptimal with regard to air pollution control (e.g., flame color or shape indicating inappropriate fuel or air input).

Knowledge Requirements

1. Knowledge of the relevant state-of-the-art in design of basic equipment for air pollution control (e.g., controlled air incinerators).

2. Knowledge of the local procedures for performance of inspections, obtaining entry, and dealing with refusal of entry.

3. Knowledge of the data collection forms and reports required for the specific inspection objective to be accomplished and the procedures for completing them.

4. Knowledge of the ethical considerations that impact on complaint handling and inspection. These ethical considerations include:

    a. Inspectors must not interfere with the acts or decisions of the control officer.

    b. The law must be applied uniformly.

    c. Recommendations for specific control equipment manufacturers are not permitted.

    d. Information acquired about an operation or company is proprietary and must never be disclosed to competitors.

    e. Inspectors (without the appropriate engineering background) will not make engineering recommendations.

    f. No gratuities.

    g. Be aware of personal biases and try to be factual and objective.

    h. Do not promise any legal or agency actions which are not possible to carry out.

    i. Maintain a neutral stance.

5. Knowledge of the recommended methods for soliciting cooperation, assistance, and operating information from the operators or managers of units to be inspected.

6. Knowledge of the jargon and terminology used by operators or management of the basic or control equipment being inspected or reviewed. This type of knowledge enables the inspector or reviewer to adequately describe his findings and to communicate with other knowledgeable individuals.

Basic resource information relevant to the above knowledge area

is available from publications of the following types:

a. Emission factors handbooks - References 3, 12, 13, and 17.

b. Descriptions of source processes with emphasis on their pollution potential - References 1, 2, 4, 5, 8, 10, 11, 18, 19, 21, 22, and 29.

c. Air pollution engineering guidelines - Reference 6.

d. Air pollution control technology - References 7, 9, 14, 15, and 16.

e. Local recommended codes of practice - References 23, 24, 25, 26, 27, 28, and 30.

7. Knowledge of the design, physical characteristics, and pollution potential of single- and multiple-chamber, silo, and flue fed incinerators in order to support recognition, identification, and description characteristics of the incinerator and its operation including:

a. Type

b. Make and model

c. Class of incinerator (using locally accepted categorization scheme)

d. Type of material burned

e. Condition of material (use waste type system)

f. Quantity of material incinerated

g. Condition of ash pit

h. Method of adjustment for air ports and feed door

i. Method of feeding (hand, cyclone, etc.)

j. Rating of incinerator (lbs./hr.)

k. Type of dampers and their location

l. Stack height, material, inside diameter

m. Smoke sensors and alarm system

n. Spark arrestor (mesh, material)

o. Burner make, model, and rating

p. Blowers and their rating (cfm)

8. Knowledge of the design, physical characteristics, and pollution potential of fuel burning equipment. The inspector should have sufficient knowledge to allow him to recognize, identify, and describe characteristics of the equipment and its operation, including:

   a. Type

   b. Make and model

   c. Maximum output (e.g., in lbs. of steam per hour)

   d. Maximum firing rate (fuel consumed per hour)

   e. Grate type and area

   f. Method of firing

   g. Fuel used (indicated grade, size, BTU/lb., ash content, sulfur content, moisture content)

   h. Boiler cleaning (methods, frequency, and duration of cleaning)

   i. Burner type (e.g., horizontal atomizing, rotary atomizing, air atomizing, steam atomizing, mechanical atomizing)

   j. Burner controls (e.g., manual, automatic high-low, automatic full modulation)

   k. Pollution control device (e.g., smoke alarm, CO_2 recorder, fly ash baffle, stack spray, wet scrubber, baghouse, etc.)

   l. Stack height, material, and inside diameter

9. Knowledge of the appropriate means of performing fuel-burning operations, including:

   a. Cleaning the fire. This includes knowledge of stoker

operation, use of a slice bar, and use of a clinker tong.

b. Coking methods for burning low volatile (smokeless) coal in fire box type heating boilers.

c. Airing a fire. This includes knowledge of the safety precautions required to avoid flashback through fire door.

d. Methods for banking fires.

e. Operating a draft gauge.

f. Starting a fire in an underfeed stoker.

10. Knowledge of potential hazards and related safety regulations to be followed during inspections, including:

a. Fire hazards

b. Restrictions against manipulating equipment without consent of the operator or management

c. Requirements for protective personal equipment, including:

1) Rubber gloves

2) Respirator

3) Goggles

4) Hard hat

5) Gas mask

6) Safety flashlight

d. Check-in procedures

e. Inspection precautions, including:

1) Location of water showers when working in areas where acids or caustic solutions are being handled

2) Use of an assistant as a "safety"

3) Not walking on building or tank roofs without appropriate supervision

4) Not watching welding activities directly

11. Knowledge of the techniques and under what conditions to use on-site test procedures and equipment during an inspection; for example, in an incinerator inspection, use of a draft gauge to measure draft or use of a Pyrometer to measure chamber temperature.

12. Knowledge of the requirements for an accurate smoke reading. These requirements include:

    a. Read plume against background contrasting in color to the color of the smoke.

    b. Light source (e.g., the sun) should be behind observer during daytime.

    c. Light source (e.g., spotlight) should be behind plume at night.

    d. Wind direction should be from either right or left side of the observer.

    e. A clear view of the stack and background should be available. In some agencies a maximum observer distance has been proposed.

    f. Record smoke-readings on the proper data collection form and at the required time intervals.

    g. Read residual plumes only, not "wet plumes."

    h. Observe and record all required environmental conditions current at the time of the observation (e.g., wind speed, percent cloud cover, wind direction, temperature, relative humidity).

    Some relevant information is available in Reference 20.

13. Detailed knowledge of local regulations relevant to the objectives, duties, and rights of the inspector. The inspector must have full knowledge of the prohibitions, required conditions, and exemptions provided in the law. The areas of the regulations the inspector needs to know include:

    a. Smoke density and opacity standards.

b. Particulate and gaseous emission standards.

c. "Public nuisance" or general "air pollution by definition" prohibitions.

d. Open burning controls.

e. Incinerator design requirements.

f. Storage, loading, and unloading of gasoline and other petroleum products.

g. Provisions of the permit system.

h. Emergency control program requirements.

14. Knowledge of the types and appearance of property damage due to air contaminants. Such damages include:

a. Acid stains

b. Discoloration of paint

c. Dust or fly ash deposits

d. Paint deposits

15. Knowledge of the methods used for describing and rating the intensity of odors.

16. Knowledge of the methods for tracking odors in order to identify the likely source of the emission, including:

a. Analysis of wind patterns

b. Area surveys

c. Use of field test equipment (e.g., Scentometer)

17. Knowledge of the procedure for preparing a notice of violation. This includes knowledge of the rules for recording information and all coding schemes used to designate data. Also, knowledge of the appropriate wording for narrative portions of the notice.

18. Knowledge of the procedure for serving violation notices and for keeping appropriate records of such activities.

19. Knowledge of the accuracy and completeness requirements for data supplied in reports and forms prepared by enforcement personnel describing alleged violations and complaints.

20. Knowledge of local regulations at a level of detail to enable identification or verification of violations as formally reported by enforcement personnel.

21. Knowledge of the alternate enforcement actions which the agency can take for a given type of violation; criteria, priorities, standards, and precedents used to select the appropriate enforcement activity.

22. Knowledge of the exterior characteristics of plants and facilities inspected and the location and configuration of the elements of the facility where air pollution problems would be evident (e.g., stacks, vents, storage areas).

23. Knowledge of the types of adjustments which can be made in operating conditions or to equipment configuration to improve performance of small incinerators or boilers.

24. Knowledge of the jargon and terminology used by operators of small incinerators and boilers.

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Special Staffing Guidance

The level of Field Enforcement Officer to be assigned to a particular

inspection will depend upon factors including:

1. Complexity of equipment to be inspected. The greater the complexity of the equipment, the higher the level of individual required.
2. The degree of proceduralization or standardization characteristic of the task. Higher level individuals are required when inspection forms and checklists do not provide explicit guidance in selecting the aspects of the equipment to inspect.
3. The credibility requirements of the task. If the success of the project or acceptability of the findings relies on the credentials of the task performer, then a senior level individual should be assigned.

Complaint Investigation

Task Overview

The objective of a complaint investigation is to satisfy the complainant's request for assistance in improving a local air pollution control problem. The investigator's role is to collect enough information to determine if the complaint is valid and can be corrected through the control functions of the agency. The following description presents a general picture of the task and its required skills and knowledge. Because many complaint investigations result in inspections, the reader is referred to the inspection task description (Page C-3) for details concerning that portion of the complaint investigation.

Occupational Category: Field Enforcement Officer

Task Description

1. Typically, the first contact with a complainant is by telephone or letter. Record the basic data required to initiate the complaint investigation. Data collection forms are normally used to support this element of the task. Assure the complainant that his problem will be investigated. Make an appointment for a visit to collect further information.
2. Visit the complainant to collect a complete description and, if possible, personally observe the noxious situation. Collect descriptive information including:
    a. Complainant identity
    b. Identity of alleged source
    c. Description of nuisance
    d. Time and frequency of nuisance
3. Observe the nuisance or its effects, if possible (e.g., odor, deposits, stains, smoke). Determine whether or not the claim is a

legitimate complaint and can possibly be corrected through agency activity.

4. Solicit local support (when required) to collect further evidence regarding the nuisance and its effects on others in the area (e.g., through the use of an "effects survey questionnaire" and completion of sworn statements describing the contaminant and its effects).

5. Use accepted procedures to identify suspected sources of the reported pollution.

6. When the likely suspect has been identified arrange for a closer inspection of the problem area. One or more of the following types of activities may be required:

   a. A source test.

   b. A detailed inspection with engineering assistance.

   c. A sample analysis (e.g., to determine the reason for a malador).

7. Perform an inspection of the alleged source (see Page C-3 for the task description dealing with routine inspections for details on this operation and the related skills and knowledge). As a result of the inspection, one or more of the following could occur:

   a. A notice of violation is prepared.

   b. The operator or manager agrees to make a change in his operation which will eliminate the nuisance.

   c. A compliance program is developed by compliance personnel or enforcement office which the source must follow.

   d. The complaint is found to be uncorrectable under the current regulations (e.g., regulations do not apply, source is uncontrollable).

   e. A request to apply for a permit is prepared.

8. Document the findings and results of the complaint investigation.

Skill Requirements

1. Ability to effectively deal with people.
2. Ability to accurately record the data provided by the complainant in an initial telephone conversation.
3. Ability to conduct a complaint investigation interview with the complainant and secure the required data without falling prey to either personal or the complainant's biases. This includes the ability to recognize exaggerations and contradictory statements from the complainant. This skill also involves the ability to reassure the complainant that the complaint is being adequately handled.
4. Ability to recognize (i.e., perceive) violations and symptoms of violations of the local regulations. The types of violations to be perceived include:
    a. Smoke density or opacity
    b. Public nuisance (odors, stains due to air contaminants)
    c. Open burning
    d. Failure to adhere to emergency emission curtailment plans
    e. Permit system violations (e.g., operation without appropriate permit)
    f. Settled dust
    g. Inadequate incinerator or boiler design or operating features
5. Ability to recognize, describe, or judge the source of general categories of stains or deposits formed by settlement of air contaminants. Such categories of stains or deposits include:
    a. Acid stains (e.g., chromic acid, sulfuric acid, hydrofluoric acid, and phosphoric acid)
    b. Oil droplets
    c. Paint deposits
    d. Carbon spheres

6. Ability to reliably and accurately detect or characterize odors such that illegal concentrations can be identified and related to the responsible source. The terminology and procedure used to rate or describe odors vary from agency to agency and depend upon accepted legal requirements.

7. Ability to take acceptable photographs of the physical evidence of air contamination. Photographs should be adequately focused, framed, and exposed.

8. Ability to identify, recognize, or locate external characteristics of plants or installations where indications of pollution are most likely to be revealed (e.g., stacks, vents, loading areas).

9. Ability to reliably and accurately judge visible emissions from stationary sources in terms of density and opacity using accepted procedures. The precision of these judgments should be adequate to serve as acceptable evidence in a court of law.

10. Ability to accurately and reliably read smoke density or opacity from mobile sources. This skill involves ability to accurately compensate for errors due to reading directly into the plume. The compensation factor used should vary as a function of the angle between the line of observation and the smoke trail.

11. Ability to accurately observe, describe, or estimate environmental conditions current at the time of a smoke observation, including wind speed and direction, relative humidity, temperature, and percent cloud cover.

12. Ability to discriminate from the physical evidence available whether or not an alleged violation or complaint is worthy of further investigation.

13. Ability to secure cooperation and assistance from complainants and other citizens in a complaint investigation (e.g., in setting up an "effects survey").

14. Ability to recognize evidence uncovered in an inspection which relates emissions from a particular source (e.g., sooty smoke

from a plant stack, or lack of an afterburner in a particular type of process) with the noxious ambient conditions which have provoked a complaint investigation (e.g., soot accumulations on drying wash, unpleasant odors).

15. Ability to identify suspected sources for complaints concerning ambient conditions (e.g., dust fallout, odors, stains).

16. Ability to utilize agency records (e.g., complaint files, plan review files, source test result files) in complaint investigation.

17. Ability to communicate with the operators or managers of the alleged source in a complaint investigation in a manner which results in their cooperation and assistance in the investigation and in instituting an abatement effort. At least, the inspector should not create resistance or negative reactions.

18. Ability to judge whether a detailed inspection is required to adequately settle a complaint issue.

19. Ability to completely and accurately fill out a notice of violation within a reasonable period of time. All narrative sections of the notice should be concise, factual, and legible.

20. Ability to prepare inspection or engineering field reports which are adequately detailed, complete, and cogent to be accepted as evidence in a court of law.

21. Ability to collect and properly prepare physical evidence of violation (e.g., damaged vegetation) for transport and further analysis.

22. Ability to effectively testify in court.

Knowledge Requirements

1. Knowledge of local procedures for performing the complaint investigation. These procedures deal with activities including:
    a. Questions to be asked of complainant and information collection forms.
    b. Reporting chronic and unjustified complaints.

c. Interacting with complainants (e.g., explaining agency philosophy and activity regarding complaints).

d. Radio communications.

2. Knowledge of the accuracy and completeness requirements for data supplied in reports and forms prepared by enforcement personnel describing alleged violations and complaints.

3. Detailed knowledge of local regulations relevant to the objectives, duties, and rights of the inspector. The inspector must have full knowledge of the prohibitions, required conditions, and exemptions provided in the law. The areas of the regulations the inspector needs to know include:

a. Smoke density and opacity standards.

b. Particulate and gaseous emission standards.

c. "Public nuisance" or general "air pollution by definition" prohibitions.

d. Open burning restrictions.

e. Incinerator design requirements.

f. Storage, loading, and unloading of gasoline and other petroleum products.

g. Provisions of the permit system.

h. Emergency control program requirements.

5. Knowledge of the types of conditions which can produce an unjustified complaint (i.e., no violation of air pollution control regulations involved). These conditions include:

a. Personal antagonism between complainant and alleged violator.

b. Real source of complaint is not related to air contaminant (e.g., noise).

c. Source of complaint is natural rather than man-made (e.g., bee spots, pollen).

d. Sickness or allergy has made complainant unusally hypersensitive to small quantities of contaminants.

5. Knowledge of the public relations considerations involved in complaint handling. These considerations include:

   a. Competent complaint handling can have a great effect on public acceptance and support of agency programs.

   b. Voluntary support from the public is critical for enforcement operations (e.g., during episodes). Effective complaint handling will help generate this type of support.

6. Knowledge of the ethical considerations that impact on complaint handling and inspection. These ethical considerations include:

   a. Inspectors must not interfere with the acts or decisions of the control officer.

   b. The law must be applied uniformly.

   c. Recommendations for specific control equipment manufacturers are not permitted.

   d. Information acquired about an operation or company is proprietary and must never be disclosed to competitors.

   e. Inspectors (without the appropriate engineering background) will not make engineering recommendations.

   f. No gratuities.

   g. Be aware of personal biases and try to be factual and objective.

   h. Do not promise any legal or agency actions.

   i. Maintain a neutral stance.

7. Knowledge of the methods used for describing and rating the intensity of odors.

8. General knowledge of the basic psychophysical and perceptual principles related to the human sense of smell. This knowledge can include:

   a. Sensory adaptation effects.

   b. Adaptation level effects.

c. Individual differences in awareness and emotional response to odors.

d. The concept of a sensory threshold as a statistical phenomenon which is affected by many external and internal variables (e.g., humidity and past experience).

9. Knowledge of the types and appearance of property damage due to air contaminants. Such damages include:

   a. Acid stains

   b. Discoloration of paint

   c. Dust or fly ash deposits

   d. Paint deposits

   e. Vegetation damage

10. Knowledge of the requirements for an accurate smoke-reading. These requirements include:

   a. Read plume against background contrasting in color to the color of the smoke.

   b. Light source (e.g., the sun) should be behind observer during daytime.

   c. Light source (e.g., spotlight) should be behind plume at night.

   d. Wind direction should be from either right or left side of the observer.

   e. A clear view of the stack and background should be available. In some agencies a maximum observer distance has been proposed.

   f. Record smoke readings on the proper data collection form and at the required time intervals.

   g. Read residual plumes only, not "wet plumes."

   h. Observe and record all required environmental conditions current at the time of the observation (e.g., wind speed, percent cloud cover, wind direction, temperature, relative humidity).

Some relevant information is available in Reference 1.

11. Knowledge of the procedure for reading an exhaust plume while following or pursuing a vehicle. Optimally, the line of observation should be perpendicular to the plume direction. Avoid reading directly into the plume, and compensate for the error if the reading cannot be made at the proper angle to the smoke trail.

12. Knowledge of the recommended methods for soliciting cooperation from complainants during a complaint investigation (e.g., an "effects" survey).

13. Knowledge of the procedures and materials used for securing written records of complaints prepared by the complainant himself. These materials usually are data collection forms filled out by the complainant which describe the pollutants and their effects (e.g., an "effects" report).

14. Sufficient knowlege of industrial or commercial process effluents to preliminarily identify suspects in a complaint investigation.

15. Knowledge of the procedures and techniques used for tracking stains and deposits to aid in identifying the probable source. This knowledge includes:

    a. Use of aerosol samplers or absorbent type panel paper to secure a sample of the material.

    b. How to arrange absorbent type panel paper in a path downwind from the contaminated area to the suspected source.

    c. How to interpret the pattern of stains on absorbent type panel paper arranged downwind from the source.

    d. What situational data to record at the time samples are secured (e.g., wind speed and direction, time and date of exposure).

    e. Methods for identifying the probable source when no specific source is suspected or there is more than one likely suspect.

    f. How to evaluate the findings from the methods listed above in order to identify the source.

16. Knowledge of the methods for tracking odors in order to identify the likely source of the emission, including:

    a. Analysis of wind patterns

    b. Area surveys

    c. Use of field test equipment (e.g., Scentometer)

17. Knowledge of data sources available within the agency to support complaint investigation. These sources might include:

    a. Reports of breakdowns in controls (some agencies require these breakdowns to be routinely reported whenever they occur).

    b. Records from previous inspections of alleged pollution source.

    c. Permit system files.

    d. Records of previous violations.

18. Knowledge of the capabilities and knowledge of agency personnel which are available, and how they can be used in conducting a complaint investigation.

19. Knowledge of the procedure for preparing a notice of violation. This includes knowledge of the rules for recording information and all coding schemes used to designate data. Also, knowledge of the appropriate wording for narrative portions of the notice.

References

1. Sticksel, P. R., and Staff (Ed.) Student's manual for evaluation of visible emissions for state and local air pollution inspectors. Columbus, Ohio: BATTELLE Columbus Laboratories, August 1971.

Special Staffing Guidance

1. Because of the great public exposure relevant to this task, complaint investigators should have thorough training and practice communicating with complainants.

2. If inspection is planned to be an integral part of the complaint handling activity, review the task description, skill requirements, and knowledge requirements for the Routine Inspection task, Page C-3.

Patrol of Assigned Areas or Routes and Citation of Violators of Air Pollution Control Regulations

Task Overview

Patrolling in most agencies is an element of the inspection activity. Patrolling involves driving over given routes or through given areas to detect violations of local regulations and to serve notice on violators. Personnel working in patrolling also investigate complaints and carry out routine inspections in small businesses, apartment houses, and small plants. The skills and knowledge required for inspection and complaint investigation elements of the patrolling activity have been covered in previous task descriptions; and this section will emphasize the task of detecting violations, particularly violations by mobile sources. Depending upon the specific agency, "mobile sources" can include automobiles, trucks, ships, locomotives, and possibly aircraft.

Occupational Category: Field Enforcement Officer

Task Description

1. Drive over the prescribed route or through the area to be covered. Detect violations of local air pollution control regulations. Pay special attention to chronic offenders who should be disciplined in court. The types of violations covered by patrol include:
   a. Smoke (from mobile and stationary sources).
   b. Open burning.
   c. Violations of emergency curtailment plans.
   d. Permit system violation (e.g., construction or operation without appropriate permit).
   e. Public nuisance.
2. Write up and serve notices of violation.
3. Carry out routine inspections (see task description package on Routine Inspection, Page C-3).

4. Carry out complaint investigation (see task description package on Complaint Investigation, Page C-21).

Skill Requirements

1. Ability to reliably and accurately judge visible emissions from stationary sources in terms of density and opacity using accepted procedures. The precision of these judgments should be adequate to serve as acceptable evidence in a court of law.
2. Ability to accurately observe, describe, or estimate environmental conditions current at the time of a smoke observation, including wind speed and direction, relative humidity, temperature, and percent cloud cover.
3. Ability to reliably and accurately detect or characterize odors such that illegal concentrations can be identified and related to the responsible source. The terminology and procedure used to rate or describe odors vary from agency to agency and depend upon accepted legal requirements.
4. Ability to identify, recognize, or locate external characteristics of plants or installations where indications of pollution are most likely to be revealed (e.g., stacks, vents, loading areas).
5. Ability to accurately and reliably read smoke density or opacity from mobile sources. This skill involves ability to accurately compensate for errors due to reading the smoke directly into the plume. The compensation factor used should vary as a function of the angle between the line of observation and the smoke trail.
6. Ability to completely and accurately fill out a notice of violation within a reasonable period of time. All narrative sections of the notice should be concise, factual, and legible.
7. Ability to answer the violator's questions regarding how he should react to the notice (e.g., pay fine by mail, appear in court). This reaction may depend on the nature of the violation.
8. Ability to recognize (i.e., perceive) violations and symptoms of violations of the local regulations. The types of violations to be perceived include:

    a. Smoke density or opacity.

b. Public nuisance (odors, stains due to air contaminants).

c. Open burning.

d. Failure to adhere to emergency emission curtailment plans.

e. Permit system violations (e.g., operation without appropriate permit).

f. Settled dust.

g. Inadequate incinerator or boiler design or operating features.

Knowledge Requirements

1. Knowledge of the requirements for an accurate smoke reading. These requirements include:

   a. Read plume against background contrasting in color to the color of the smoke.

   b. Light source (e.g., the sun) should be behind observer during daytime.

   c. Light source (e.g., spotlight) should be behind plume at night.

   d. Wind direction should be from either right or left side of the observer.

   e. A clear view of the stack and background should be available. In some agencies a maximum observer distance has been proposed.

   f. Record smoke-readings on the proper data collection form and at the required time intervals.

   g. Read residual plumes only, not "wet plumes."

   h. Observe and record all required environmental conditions current at the time of the observation (e.g., wind speed, percent cloud cover, wind direction, temperature, relative humidity).

Some relevant information is available in Reference 1.

2. Detailed knowledge of local regulations relevant to the objectives, duties, and rights of the inspector. The inspector must have full knowledge of the prohibitions, required conditions, and exemptions provided in the law. The areas of the regulations the inspector needs to know include:

    a. Smoke density and opacity standards.

    b. Particulate and gaseous emission standards.

    c. "Public nuisance" or general "air pollution by definition" prohibitions.

    d. Open burning controls.

    e. Incinerator design requirements.

    f. Storage, loading, and unloading of gasoline and other petroleum products.

    g. Provisions of the permit system.

    h. Emergency control program requirements.

3. Knowledge of the methods used for describing and rating the intensity of odors.

4. Knowledge of the basic psychophysical and perceptual principles related to the human sense of smell. This knowledge can include:

    a. Sensory adaptation effects.

    b. Adaptation level effects.

    c. Individual differences in awareness and emotional response to odors.

    d. The concept of a sensory threshold as a statistical phenomenon which is affected by many external and internal variables (e.g., humidity and past experience).

5. Knowledge of the procedure for reading an exhaust plume while following or pursuing a vehicle. Optimally, the line observation should be perpendicular to the plume direction. Avoid reading directly into the plume, and compensate for the error if the reading cannot be made at an angle to the smoke trail.

6. Knowledge of the procedures for pulling a suspect off to the side of the road (including the associated traffic hazards and appropriate precautions).

7. Knowledge of the procedure for preparing a notice of violation. This includes knowledge of the rules for recording information and all coding schemes used to designate data. Also, knowledge of the appropriate wording for narrative portions of the notice.

8. Knowledge of the procedure for serving violation notices and for keeping appropriate records of such activities.

9. Knowledge of the special procedural requirements for citing violations by vehicles other than cars and trucks (i.e., locomotives, ships). For example, in the case of ships, certain types of ships or operating conditons may be exempt from control:

   a. U. S. Government ships may be exempt

   b. Soot blowing may not be illegal

10. Knowledge of the accuracy and completeness requirements for data supplied in reports and forms prepared by enforcement personnel describing alleged violations and complaints.

11. Knowledge of the types of data contained in agency enforcement files and their application to inspection, complaint handling, and other enforcement activities.

12. Knowledge of the terminology and language used in agency files of past enforcement action.

13. Knowledge of the methods for patrol inspectors to make a preliminary identification of a possible source of an odor violation which would then provide the basis for further investigation.

References

1. Sticksel, P. R., and Staff (Ed.) Student's manual for evaluation of visible emissions for state and local air pollution inspectors. Columbus, Ohio: BATTELLE Columbus Laboratories, August 1971.

Special Staffing Guidance

1. Because of the great public exposure relevant to this task, the assignee should have thorough training and practice communicating with complainants.

2. If inspection or complaint handling is planned to be an integral part of the patrolling activity, review the task descriptions, skill requirements, and knowledge requirements for those tasks on Pages C-3 and C-21.

Assist the Legal Staff in Preparation of Enforcement Actions

Task Overview

In order to cope with heavy enforcement case loads, many agencies provide their attorneys with assistance in preparing testimony, witnesses, evidence, and follow-up paperwork. The legal assistance task requires skills and knowledge relevant to both air pollution control and legal issues. The following task description presents the sequence of activities representative of those performed to assist the agency's legal staff.

Occupational Category: Field Enforcement Officer (Senior)

Task Description

1. Review all materials submitted by inspectors pertaining to pending legal action and which may be used as evidence. These materials can include:
   a. Formal violation reports
   b. Smoke observation reports
   c. Boiler or incinerator inspection reports
   d. Industrial inspection reports
   e. Sampling results (stack etc.)

   Check that all required information is entered accurately and at the proper level of detail. For example, in a smoke observation report assure that:
   a. The point of observation is completely identified.
   b. The viewing distance does not exceed locally accepted limits.
   c. Wind speed is estimated at a reasonable level or determined with an instrument.
   d. Stack is identified.

e. Appropriate number of readings are made at the proper time intervals.

f. Wind direction is appropriate for an acceptable reading.

g. Sun in right position with respect to stack.

If data is improperly recorded or inadequate in some way, request that the responsible inspector make appropriate corrections.

2. Identify the regulation violated. Determine if, indeed, a violation has occurred.

3. Check current variances to see if the apparent violation is amenable to legal action. Assure that the reported violation is independent of variances held by the alleged polluter. If the violation is covered by a variance, follow locally prescribed procedures for filing that information. If the apparent violation is not covered by a variance, go on to the next steps.

4. Check the enforcement files to determine if the violater has a previous record of complaints, litigations, or convictions for similar or the same violation.

5. Select the appropriate compliance action to take for the alleged violation. This decision may require discussions with agency management or the agency attorney. Local guidelines are usually available for routine situations. For example, first violations for open burning or auto emission violations may be treated with a ticket rather than a court action.

6. In cases where some legal action will be taken, assist in preparing the necessary paperwork. Such materials may include:

   a. A formal complaint or violation statement

   b. An abatement order

   c. A summons on Civil Complaint

   d. A Declaration in Support of an Arrest Warrant

   e. Subpoenas

7. File all formal documents with the appropriate judicial offices.

8. Secure all required witnesses from within or outside of the agency and prepare or brief them for their appearance in court.

9. Attend all arraignments and court cases, provide the attorney with technical support as needed, and take notes on the proceedings. Tesify if necessary for successful prosecution.

10. After the case has been completed, prepare required progress reports for enforcement department files and formal post-litigation documents. Such reports can include:

    a. Description of complaint.

    b. Description of arraignment (including date filed, judge's name, plea, and trial dates).

    c. Description of the trial (including judge's name and prosecutor's name).

    d. Trial disposition (decision, amount of fine, jail sentence, or probation terms).

    Post-litigation documents can include:

    a. Cease and desist orders.

    b. Permanent injunctions.

Skill Requirements

1. Ability to effectively communicate with agency personnel to provide missing data to complete filed violation reports. Also, ability to instruct them to insure that missing data won't happen again.

2. Ability to identify or recognize missing, inadequately detailed, or incorrect data on reports describing alleged violations. These materials can include:

    a. Formal violation reports

    b. Smoke observation reports

    c. Boiler or incinerator inspection reports

    d. Industrial inspection reports

    This ability involves checking that all required information is entered accurately and at the proper level of detail. For example,

in a smoke observation report assure that:

a. The point of observation is completely identified.

b. The viewing distance does not exceed locally accepted limits.

c. Wind speed is estimated at a reasonable level or determined with the appropriate instrument.

d. Stack is identified.

e. Appropriate number of readings are made at the proper time intervals.

f. Wind direction is appropriate for an acceptable reading.

3. Ability to identify or verify the specific section of local regulations which was allegedly violated as reported by enforcement personnel.

4. Ability to determine if a reported violation is independent of a variance held by the alleged polluter.

5. Ability to determine whether or not a formally reported violation is similar to previously reported violations or complaints against the alleged violator.

6. Ability to select enforcement actions which are appropriate for specific types of violations and circumstances. This skill may require the ability to interact with attorneys and high level management in selecting the appropriate enforcement action.

7. Ability to accurately and completely prepare materials required for arraignments and court cases. Such materials include:

a. Formal complaint or violation statements

b. Abatement orders

c. Summons on Civil Complaint

d. Declaration in Support of an Arrest Warrant

e. Subpoenas

8. Ability to rehearse or brief witnesses in the recommended behavior for testifying as a witness in court.

9. Ability to prepare and rehearse a presentation to be made before a court, hearing board, or other legal or quasi-legal body.

10. Ability to accurately and completely prepare post-hearing documents and progress reports. The formal documents could include cease and desist orders and permanent injunctions. The progress reports might include:

    a. Description of complaint.

    b. Description of arraignment (including date filed, judge's name, plea, and trial dates).

    c. Description of the trial (including judge's name and prosecutor's name).

    d. Trial disposition (decision, amount of fine, jail sentence, or probation terms).

11. Ability to recognize and record events during court proceedings which are worthy of documenting.

Knowledge Requirements

1. Knowledge of the accuracy and completeness requirements for data supplied in reports and forms prepared by enforcement personnel describing alleged violations and complaints.

2. Knowledge of local regulations at a level of detail to enable identification or verification of violations as formally reported by enforcement personnel.

3. Knowledge of agency variance reporting and filing methods and the terminology used in those files.

4. Knowledge of the types of data contained in agency enforcement files and their application to inspection, complaint handling, and other enforcement activities.

5. Knowledge of the terminology and language used in agency files of past enforcement action.

6. Knowledge of the procedures and appropriate legal terminology to use in completing documentation required in hearings or court

cases. Such materials may include:

a. A formal complaint or violation statement

b. An abatement order

c. A Summons on Civil Complaint

d. A Declaration in Support of an Arrest Warrant

e. Subpoenas

7. Knowledge of the procedure for filing pre-trial documentation with local courts or other relevant authorities.

8. Knowledge of the technical information usually requested of a witness to qualify him as an expert. This technical information includes:

   a. Rules and regulations relevant to the case.

   b. The principles and methods of reading smoke density and opacity.

   c. The technical definition of smoke density and opacity and an explanation of how they differ.

   d. The facts of the case (from memory).

   e. The duties of an air pollution inspector, engineer, or whatever role the witness may play.

9. Knowledge of the procedure for preparing a presentation to be given before a court, hearing board, or other legal or quasi-legal body.

10. Knowledge of the appropriate dress and decorum for presentation before a court, hearing board, or other legal or quasi-legal body.

11. Knowledge of aspects or characteristics of court proceedings worthy of recording.

12. Knowledge of the procedures and terminology used in preparing formal post-trial documentation, which may include:

    a. Cease and desist orders

    b. Injunctions

13. Knowledge of the alternate enforcement actions which the agency can take for a given type of violation; criteria, priorities, standards, and precedents used to select the appropriate enforcement activity.

Special Staffing Guidance

1. This assignment requires a broadly experienced and skilled senior member of the Field Enforcement Officer occupational category. He should have detailed knowledge of the types of violations and enforcement actions likely to occur. He should have the verbal ability to work with attorneys, and should have had numerous and effective experiences serving as a witness in court or before a hearing board.

2. If the task requires an extensive amount of non-proceduralized, non-standardized writing (e.g., in preparing documents), the assignee should have proven writing abilities.

3. Because of the nature of the skills and knowledge required for this task the assignee should have a Bachelor's Degree with some courses in technical or physical science areas.

Serving as a Witness in Court or at a Hearing

Task Overview

Frequently, agency personnel must appear in court or before a hearing body to represent the agency as an expert witness. At this time, they must make their presentation clearly and respond to cross-examination or criticism from opponents of the agency's position. The following descriptive material deals with the general problem of qualifying as an expert witness and appropriate decorum in court.

Occupational Category: Field Enforcement Officer
Engineer
Chemist
Meteorologist
Air Pollution Control Director
Resources Administrator

Task Description

1. In order to prepare for an appearance in court, refer to the file containing the history of the case to be covered and review the relevant details.
2. Identify the types of information defense attorneys usually request to qualify (or disqualify) a witness and learn the appropriate responses. Many agencies have a courtroom liaison or legal assistant who can provide this type of information. Interaction with the agency's attorney may be necessary.
3. Appear in court punctually and dressed appropriately.
4. Present testimony effectively.
5. Leave courtroom as soon as excused as a witness or according to the appropriate courtroom procedure.

Skill Requirements

1. Ability to present testimony effectively in court. Effective testimony can be characterized as:

   a. Confidently presented

   b. Truthful

   c. Brief

   d. Responsive to the questions asked

   e. Responsive only to questions asked

   f. Unbiased

   g. Clearly and audibly spoken

   h. Courteously presented

   i. Confined to matters within the witness's area of expertise

   This ability includes responding effectively under cross-examination. Also includes skill in qualifying as a competent (therefore, valid) witness. For example, in the case where the witness has made a smoke-reading, he will often have to establish himself as a competent smoke-reader (e.g., by describing his smoke-reading training or explaining the difference between smoke density and opacity).

2. Ability to prepare and rehearse a presentation to be made before a court, hearing board, or other legal or quasi-legal body.

3. Ability to answer (in public) general and technical questions concerning air pollution control technology and regulatory or control functions. The level of detail required for the response will vary as a function of the audiences addressed. Such audiences can include:

   a. Legislative bodies or hearing boards

   b. Citizen groups

   c. Representatives of industry

   d. News media

Knowledge Requirements

1. Knowledge of the technical information usually requested of a witness to qualify him as an expert. This technical information includes:

    a. Rules and regulations relevant to the case.

    b. The principles and methods of reading smoke density and opacity.

    c. The technical definition of smoke density and opacity and an explanation of how they differ.

    d. The facts of the case which comprise the witness's testimony (e.g., technical data, research findings).

    e. The duties of an air pollution inspector, engineer, or whatever role the witness may play.

2. Knowledge of the procedure for preparing a presentation to be given before a court, hearing board, or other legal or quasi-legal body.

3. Knowledge of the appropriate dress and decorum for presentation before a court, hearing board, or other legal or quasi-legal body.

Organization and Operation of a Smokeschool

Task Overview

Many agencies offer formal training in the area of "reading" (i.e., visually judging) density and opacity of smoke. These so-called "smokeschools" typically offer introductory lectures and visual aids on topics related to visible emissions and provide practice making smoke judgments. The smoke is provided by a special smoke generator designed for training purposes.

Organization, preparation, and administration of the program is not a full-time activity. However, it has been included in this study as it can require skills and knowledge which are not otherwise required of air pollution control agency personnel.

Occupation Category: Field Enforcement Officer (Senior)

Task Description

1. Schedule the course. In scheduling the course consider the following factors:
    a. Availability of required facilities and equipment.
    b. Availability of students (both initial and repeats).
    c. Availability of lecturers and guests.
2. Design and prepare the content of the training program. Depending on the extent that previously prepared materials are used, this includes activities such as:
    a. Prepare lectures and other instructional materials covering topics which are directly related to the skill and knowledge requirements of the intended trainees.
    b. Modify existing materials so that they are responsive to the requirements of the trainees.
    c. Arrange the units of instruction into an agenda.

d. Secure guest instructors and brief them on the topics they will cover.

e. Determine the topics to be covered by examination and quizzes and prepare the necessary materials.

3. Make final preparations for administration of the course including:

a. Assure that all printed materials, teaching aids, and other materials are prepared or available in the appropriate numbers.

b. Check that classroom and other training areas are adequate for instructional needs (e.g., if films are to be shown, classroom should be capable of being darkened).

c. Check availability of all required equipment.

d. Prepare the required examinations and quizzes. Appropriate answer sheets should also be available.

4. If a smoke generator is to be used in course prepare for the course with activities including:

a. Perform any check-out and calibration procedures that are required.

b. Operate the smoke generator in the manner in which it will be used during the course (i.e., a trial run).

c. Identify and correct any malfunctions that appear during check-out or the trial run.

5. Once the course has been planned and all arrangements are made, administer the course. This includes:

a. Make opening comments

b. Coordinate guest instructors

c. Distribute materials as needed

d. Deliver lectures

e. Administer examinations and smoke-reading tests

f. Provide feedback and remedial assistance to students

g. Answer student questions

h. Maintain the schedule as planned

6. Maintain records of each student so that he can be recertified approximately every six months.

Skill Requirements

1. Ability to identify and describe training requirements for information and skill in order to determine content areas to be covered in a program. This requires:

   a. Identification and description of the tasks to be performed by the trainee on the job which are to be covered by the course.

   b. Identification of the skills and knowledge required to effectively perform those tasks.

   c. Identification of those required skills and knowledge not currently held by the trainees and, therefore, reasonable content areas for the course to attack.

      The extent to which this skill is required depends upon the degree of freedom available to the school operator in designing the course.

2. Ability to prepare training objectives. These objectives should adequately describe the behavior and knowledge to be acquired, the conditions under which these behaviors will be employed on the job, and the performance levels the trainee must achieve to demonstrate competence.

3. Ability to design and prepare training approaches, materials, lectures, visual aids, etc., required to enable trainees to achieve course objectives. Maximize characteristics including:

   a. Cost/effectiveness

   b. Job-relevance

   c. Student involvement and participation

4. Ability to prepare written and behavioral tests of the knowledge and skill trainees are to achieve in training.

5. Ability to provide the type of feedback invididual trainees require to support learning and performance in training or on the job. This includes providing the technical information or practice required to:

   a. Answer questions

   b. Alleviate confusion

   c. Improve substandard learning or performance

6. Ability to operate, calibrate, and maintain the smoke generator used in a smoke-reading course.

7. Ability to communicate effectively with agency personnel in working on operational problems involving enforcement, engineering, or technical activities of the agency.

8. Ability to deliver training program presentations to a group of trainees composed of a variety of types of agency personnel (inspectors, engineers, chemists, management).

9. Ability to carry out task description and task analysis procedures as a precursor to personnel system developments including:

   a. Training

   b. Job specifications

   c. Personnel selection criteria

   d. Performance aid development

Knowledge Requirements

1. Knowledge of the procedures for scheduling training course class meetings. In setting up the schedule, consideration should be given to factors including:

   a. Availability of required facilities and equipment

   b. Availability of students

   c. Availability of lecturers and guests

2. Knowledge of the training materials and equipment available relevant to visible emissions and smoke-reading. These materials may include References 1, 2, 3, and 4.

3. Detailed knowledge of the content areas currently included in existing smoke-reading courses or likely to be included in a course designed to apply to tasks involving visible emissions. These areas include:

    a. Techniques of smoke-reading (density and opacity)

    b. Meteorological factors in smoke-reading

    c. Legal aspects

    d. Local procedures for reporting emission violations

4. Knowledge of the types of content specialists who could contribute to the effectiveness of a training course by making presentations. These specialists could be selected from the agency, industry, or government officials.

5. Knowledge of the procedures and materials (e.g., response forms) used for practice and testing of smoke-reading with a smoke generator. (See Reference 3.)

6. Knowledge of the procedure for making final preparations for administering a training course (after course materials have been designed and prepared).

7. Knowledge of the procedures for operation, calibration, and maintenance of a smokeschool smoke generator.

8. Knowledge of recommended procedures for maintaining records of student participation in a training program.

9. Knowledge of the technical information usually requested of a witness to qualify him as an expert. This technical information includes:

    a. Rules and regulations relevant to the case.

    b. The principles and methods of reading smoke density and opacity.

    c. The technical definition of smoke density and opacity and an explanation of how they differ.

d. The facts of the case (from memory).

e. The duties of an air pollution inspector, engineer, or whatever role the witness may play.

10. Knowledge of the appropriate dress and decorum for presentation before a court, hearing board, or other legal or quasi-legal body.

11. Knowledge of the accepted techniques for planning and presenting written or spoken communications such as technical reports, public presentations, and formal correspondence.

12. Knowledge of principles and procedures for identifying training requirements, preparing training objectives, and developing a program to achieve the objectives.

13. Knowledge of the procedures for administering the smokeschool course. This includes knowledge of procedures for the following:

    a. Opening comments

    b. Coordinating guest instructors

    c. Distributing materials as needed

    d. Delivering lectures

    e. Administering examinations and smoke-reading tests

    f. Providing feedback

    g. Maintaining the schedules

14. Knowledge of the agency regulations and procedures relevant to smoke-reading tasks (e.g., requirements for accuracy, data record forms, peripheral information requirements, applications or uses in enforcement efforts).

15. Knowledge of the requirements for an accurate smoke reading. These requirements include:

    a. Read plume against background contrasting in color to the color of the smoke.

    b. Light source (e.g., the sun) should be behind observer during daytime.

c. Light source (e.g., spotlight) should be behind plume at night.

d. Wind direction should be from either right or left side of the observer.

e. A clear view of the stack and background should be available. In some agencies a maximum observer distance has been proposed.

f. Record smoke-readings on the proper data collection form and at the required time intervals.

g. Read residual plumes only, not "wet plumes."

h. Observe and record all required environmental conditions current at the time of the observation (e.g., wind speed, percent cloud cover, wind direction, temperature, relative humidity).

Some relevant information in available in Reference 4.

References

1. Institute for Air Pollution Training. Introduction to air pollution control. Research Triangle Park, North Carolina: Environmental Protection Agency, Air Pollution Control Office.

2. Institute for Air Pollution Training. Visible emissions evaluation. Research Triangle Park, North Carolina: U. S. Department of Health, Education, and Welfare; Public Health Service, Environmental Health Service.

3. Sticksel, P. R. (Ed.) Instructor's and operator's manual for evaluation of visible emissions for state and local air pollution inspectors. Columbus, Ohio: BATTELLE Columbus Laboratories, 1971.

4. Sticksel, P. R., and Staff (Ed.) Student's manual for evaluation of visible emissions for state and local air pollution inspectors. Columbus, Ohio: BATTELLE Columbus Laboratories, August 1971.

Special Staffing Guidance

1. The assignee for this task should be a senior member of the Field Enforcement Officer occupational category, with considerable field experience in reading smoke under a variety of viewing conditions.

2. The assignee should be capable of assessing training needs and designing and administering a responsive program. The assignee should perform this aspect of the task with the guidance and supervision of the director of enforcement activities. Development of effective training is a complex and difficult activity involving a number of abstract concepts and requiring considerable creativity. Therefore, it should be closely supervised by a higher level individual (e.g., the Agency Resources Administrator or a Program Planning and Development Specialist).

3. The assignee should have had numerous and successful experiences testifying in court or before a hearing board relating his smoke-reading judgments.